

**FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT**



U. S. Department of Energy

National Energy Technology Laboratory

**University Research in Advanced Combustion and Emissions
Control**

DE-PS26-09NT0001227

Announcement Type: Initial

CFDA Number: 81.117 Energy Eff. & Renew Energy Info Tech Asst.

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Letter of Intent Due Date:	Not Applicable
Pre-Application Due Date:	Not Applicable
Application Due Date:	01/16/2009 11:59:59 PM Eastern Time

NOTE: NEW REQUIREMENTS FOR GRANTS.GOV

Where to Submit

Applications must be submitted through Grants.gov to be considered for award. You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately. Remember you have to update your CCR registration annually. If you have any questions about your registration, you should contact the Grants.gov Helpdesk at 1-800-518-4726 to verify that you are still registered in Grants.gov.

Registration Requirements

There are several one-time actions you must complete in order to submit an application through Grants.gov (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contract Registry (CCR), register with the credential provider, and register with Grants.gov). See <http://www.grants.gov/GetStarted>. Use the Grants.gov Organization Registration Checklist at <http://www.grants.gov/assets/OrganizationRegCheck.pdf> to guide you through the process. Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in the CCR registration process. Applicants, who are not registered with CCR and Grants.gov, should allow at least 21 days to complete these requirements. It is suggested that the process be started as soon as possible.

IMPORTANT NOTICE TO POTENTIAL APPLICANTS: When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. Grants.gov registration).

Microsoft Vista and Office 2007 Compatibility

Grants.gov is currently incompatible with both the new Microsoft (MS) Vista Operating System and the new Microsoft (MS) Office 2007 versions of Word, Excel, and Power Point. In order to create and submit your application to Grants.gov, you must find a computer with a previous version Microsoft Operating System, such as Windows XP.

If you attach a file created using MS Office 2007, you will not get an error message when you submit the application, HOWEVER, your entire application will not be able to be processed or accepted at Grants.gov and will not reach DOE. Grants.gov can accept applications with attachments created in MS Office 2007 if the attachments are saved in the prior format. See the http://www.grants.gov/assets/Vista_and_office_07_Compatibility.pdf for detailed instructions on how to do this. A file created in MS Office 2007 can be identified by the "x" at the end of the file extension, for example "sample.docx" for a Word file. Contact Grants.gov at 1-800-518-4726 with any questions.

Questions

Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. Part VII of this announcement explains how to submit other questions to the U.S. Department of Energy (DOE).

Application Receipt Notices

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five e-mails. It is extremely important that the AOR watch for and save each of the emails. It may take up to two (2) business days from application submission to receipt of email Number 2. When the AOR receives e-mail Number 5, it is their responsibility to follow the instructions in the e-mail to logon to IIPS and verify that their application was received by DOE. The titles of the five e-mails are:

- Number 1 – Grants.gov Submission Receipt Number
- Number 2 – Grants.gov Submission Validation Receipt for Application Number
- Number 3 – Grants.gov Grantor Agency Retrieval Receipt for Application Number
- Number 4 – Grants.gov Agency Tracking Number Assignment for Application Number
- Number 5 – DOE e-Center Grant Application Received

The last email will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last email changes to:

Number 5 – DOE e-Center Grant Application Received and Matched

This email will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

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PART I – FUNDING OPPORTUNITY DESCRIPTION

BACKGROUND

The Department of Energy (DOE), National Energy Technology Center (NETL) on behalf of the Office of Energy Efficiency and Renewable Energy (EERE) Vehicle Technologies Program (VT) is seeking applications from U.S. Colleges and Universities and University-Affiliated Research Institutions for cost-shared technology development projects. One goal of the technology development is to enable an increase in the efficiency of internal combustion engines while minimizing the energy penalty of meeting emissions regulations. This will be achieved through research and development of advanced combustion regimes and emission control strategies coupled with advanced gasoline or diesel like fuel formulations.

Another goal is to develop fundamental science and engineering which will support the development and commercialization of clean, efficient internal combustion engine powertrains operating on both non-petroleum-based and petroleum-based fuels. The high-level performance goals supported by this R&D activity are a 20-40% improvement in fuel economy in a light-duty vehicle and the attainment of 55% brake thermal efficiency in heavy-duty engine systems. Achieving breakthrough efficiencies in an engine and/or powertrain system for either light- or heavy-duty vehicles is a very challenging objective, but one that must be achieved to reduce the nation's petroleum consumption to levels that are economically and environmentally sustainable. Over the three year period of this activity, the selected participants will develop fundamental knowledge and early applied technology in advanced combustion, efficient emission control, and advanced fuel formulation to enable the realization of these vehicle efficiency goals.

Eligibility for this Funding Opportunity Announcement is restricted to U.S. Colleges and Universities and University-Affiliated Research Institutions. The primary motivation for restricting eligibility is to increase university involvement with the Vehicles Technologies Program to assure the inclusion of fresh, innovative ideas in the program, and to educate future scientists and engineers in advanced automotive/vehicle technologies.

AREAS OF INTEREST

In keeping with the desire to encourage innovation, this FOA will include the following two Areas of Interest. Applicants are cautioned that this funding opportunity announcement is a master announcement and that each program area of interest has its own program-specific number for submission of applications.

1. Advanced Combustion – DE-PS26-09NT0001227-01
2. Efficient Emission Control Devices – DE-PS26-09NT0001227-02

Applicants should submit their application under the program area of interest which best fits the majority of the effort to be performed. If an application is submitted under a program area of interest in which DOE believes fits more appropriately under the other area of interest, the government has the authority to evaluate the application under the appropriate area of interest. You may submit more than one application under the same area of interest or one for each area of interest. Each application must have its own unique title on the subject line (i.e., project title and principal investigator/project director, if any). Do not submit an identical application under more than one area of interest.

AREA OF INTEREST 1: ADVANCED COMBUSTION

Lean-Burn and Low-Temperature Combustion (LTC) strategies provide the potential for engines with high, diesel-like efficiencies and dramatically lower engine-out emissions. The challenge in lean-burn combustion is to decrease the fuel-air ratio to below chemically stoichiometric levels (14.7 times the mass of air to fuel) while maintaining stable combustion with low engine-out emissions. This requires new control strategies employing fast-response sensors and processors, greater dynamic range boost and valve actuation systems, and high-efficiency NO_x and PM control. LTC involves developing lean or dilute mixtures in-cylinder, which after compression ignition, have peak combustion temperatures below approximately 1900 K to minimize NO_x formation in-cylinder. LTC strategies range from Homogeneous Charge Compression Ignition (HCCI) to strategies involving compression ignition of partially premixed fuel charges. Although an engine may theoretically operate in a single advanced mode such as lean-burn or LTC, production feasible engines will more likely employ a combination of combustion strategies such as conventional Compression Ignition Direct Injection (CIDI) or spark-ignited (SI) combustion at higher loads and starting conditions, and LTC (or lean-burn for gasoline) at moderate to light loads referred to as “mixed-mode” operation. Mixed-mode options offer the potential to couple the strengths of both conventional and advanced combustion modes. Engine sizes being considered include light-duty (e.g., automotive) through heavy-duty (e.g., Class 8 trucks).

Applications under this Area of Interest shall focus on research to improve understanding and/or develop technologies that enable LTC or lean-burn gasoline. Examples include but are not limited to:

- Research to improve understanding of the fundamental effects of fuel injection, air motion (e.g., swirl), and combustion chamber geometry on fuel-air mixing, combustion and emission formation processes for a range of advanced combustion regimes, as well as accurately simulating these processes. This includes improving the understanding of fuel injection parameters (e.g., timing, spray-type, orifice geometry, injection pressure, single pulse *versus* multi-pulse, *etc.*) on LTC and lean-burn regimes.
- Experiments and modeling to define the precision in temperature control and methodology needed for start of combustion in LTC modes.
- Studies of wall heat transfer characteristics during LTC. Because of the sensitivity of the LTC processes to temperature, improved understanding of wall heat transfer under LTC operation is needed to develop engines that operate effectively and to develop control strategies. Also determine whether LTC modes offer a net reduction in wall heat transfer that would lead to an efficiency improvement.
- Provide fundamental data on methods for controlling the transition from advanced combustion to convention combustion during rapid engine transients experienced in automotive applications.
- Explore methods to increase power density in LTC or lean-burn operation.
- Reduce HC and CO emissions and associated combustion inefficiencies at low loads, especially for pure HCCI combustion and NO_x emissions in lean-burn combustion.

AREA OF INTEREST 2: EFFICIENT EMISSION CONTROL DEVICES

Applications submitted under this Area of Interest shall support the overall effort in modeling of emission control (after treatment) devices as described at www.cleers.org. Example research subjects would include but are not limited to:

- Experiments and/or models of aging mechanisms in lean NO_x traps.

- Experiments and/or models to explain the function of various hydrocarbons, CO, and hydrogen in lean NOx traps.
- Experiments and/or models to understand the process of S poisoning in lean NOx traps.
- Experiments and/or models of deSulfation processes of lean NOx traps.
- Characterization of the role of precious metals in the function of lean NOx traps and definition of potential pathways for reduction of precious metal loadings.
- Experiments and/or models of lean NOx trap catalyst performance and aging under temperatures and conditions associated with lean gasoline engines.
- Studies of NH₃ production and utilization in a lean NOx trap with emphasis on either production for hybrid LNT-SCR systems or minimization of NH₃ emissions for lean NOx trap only systems.
- Experiments and/or models of hybrid lean NOx trap-SCR catalyst systems.
- Experiments and/or models to improve understanding of diesel particle filter phenomena at the soot cake layer and filter regeneration for DI gasoline and diesel applications.
- Experiments and/or models to improve understanding of Selective Catalytic Reduction (SCR) processes with either urea or hydrocarbons; low-temperature operation with urea SCR; hydrocarbon SCR combined with LTC modes.
- Studies of hydrocarbon masking of SCR catalysts as a function of the type of materials used.
- Studies of hydrolysis for urea to ammonia conversion.

PART II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

- DOE anticipates awarding cooperative agreements under this program announcement (See Section VI.B.2 Statement of Substantial Involvement)

B. ESTIMATED FUNDING

- Approximately \$7,000,000 in DOE funding is expected to be available for new awards under this announcement.

C. MAXIMUM AND MINIMUM AWARD SIZE

- Ceiling (i.e., the maximum amount for an individual award made under this announcement):
\$ 3,000,000 (DOE Share)
- Floor (i.e., the minimum amount for an individual award made under this announcement):
\$ 500,000 (DOE Share)

D. EXPECTED NUMBER OF AWARDS

- DOE anticipates making 4-6 awards under this announcement depending on the size of the awards.

E. ANTICIPATED AWARD SIZE

- DOE anticipates that awards will be in the \$600,000 - \$3,600,000 range (*including cost share, if applicable*) for the total project period.

F. PERIOD OF PERFORMANCE

- DOE anticipates making awards that will run for up to 3 years over multiple budget periods.

G. TYPE OF APPLICATION

- DOE will only accept new applications under this announcement.

PART III - ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS

In accordance with 10 CFR 600.6(b), eligibility for award is restricted to U.S. Universities, colleges, and university-affiliated research institutions located in the United States of America and its territories, including the Commonwealth of Puerto Rico and the Virgin Islands. Submissions from university-affiliated research institutes must be through the university. The university, not the university-affiliated research institute, will be the award recipient. In addition, the following criteria must be met:

- Principal Investigator or Co-Principal Investigator listed on the application must be a teaching professor at the proposing university. If this condition is met, other participants, i.e., Co-Principal Investigators or research staff, who do not hold teaching or student positions may be included as part of the research team.
- Proposals from university-affiliated research institutions must be submitted through the college or university with whom they are affiliated.
- At least one student registered at the university is to receive compensation for work performed in the conduct of the research proposed.

B. COST SHARING

- The cost share must be at least 20% of the total allowable costs for research and development projects (i.e., the sum of the Government share, including FFRDC contractor costs if applicable, and the recipient share of allowable costs equals the total allowable cost of the project) and must come from non-Federal sources unless otherwise allowed by law. (See 10 CFR part 600 for the applicable cost sharing requirements.)

C. OTHER ELIGIBILITY REQUIREMENTS

- **Federally Funded Research and Development Center (FFRDC) Contractors.** FFRDC contractors are not eligible for an award under this announcement, but they may be proposed as a team member on another entity's application subject to the following guidelines:

Cost Share. The applicant's cost share requirement will be based on the total cost of the project, including the applicant's and the FFRDC contractor's portions of the effort.

FFRDC Contractor Effort:

- The FFRDC contractor effort, in aggregate, shall not exceed 25% of the total estimated cost of the project, including the applicant's and the FFRDC contractor's portions of the effort.

Responsibility. The applicant, if successful, will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including but not limited to, disputes and claims arising out of any agreement between the applicant and the FFRDC contractor.

PART IV – APPLICATION AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST APPLICATION PACKAGE

- Application forms and instructions are available at Grants.gov. To access these materials, go to <http://www.grants.gov>, select “Apply for Grants,” and then select “Download Application Package.” Enter the CFDA and/or the funding opportunity number located on the cover of this announcement and then follow the prompts to download the application package.

B. CONTENT AND FORM OF APPLICATION – 424 (R&R)

You must complete the mandatory forms and any applicable optional forms (e.g., Disclosure of Lobbying Activities (SF-LLL)) in accordance with the instructions on the forms and the additional instructions below. Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this announcement.

1. **SF 424 (R&R)** Complete this form first to populate data in other forms. Complete all the required fields in accordance with the pop-up instructions on the form. To activate the instructions, turn on the “Help Mode” (Icon with the pointer and question mark at the top of the form). The list of certifications and assurances referenced in Field 18 can be found on the DOE Financial Assistance Forms Page at http://management.energy.gov/business_doe/business_forms.htm under Certification and Assurances.
2. **RESEARCH AND RELATED Other Project Information**
Complete questions 1 through 5 and attach files. The files must comply with the following instructions:

Project Summary/Abstract (Field 6 on the Form)

The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects). This document must not include any proprietary or sensitive business information as the Department may make it available to the public. The project summary must not exceed 1 page when printed using standard 8.5” by 11” paper with 1” margins (top, bottom, left and right) with font not smaller than 11 point. To attach a Project Summary/Abstract, click “Add Attachment.”

Project Narrative (Field 7 on the Form)

The project narrative must not exceed 30 pages, including cover page, table of contents, charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right). **EVALUATORS WILL ONLY REVIEW THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE.** The font must not be smaller than 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application, because the information contained in these sites will not be reviewed. See Part VIII.D for instructions on how to mark proprietary application information. To attach a Project Narrative, click “Add Attachment.”

The project narrative must include:

- **Project Objectives:** This section should provide a clear, concise statement of the specific objectives/aims of the proposed project.

- Merit Review Criterion Discussion The section should be formatted to address each of the merit review criterion and sub-criterion listed in Part V.A. Provide sufficient information so that reviewers will be able to evaluate the application in accordance with these merit review criteria. DOE WILL EVALUATE AND CONSIDER ONLY THOSE APPLICATIONS THAT ADDRESS SEPARATELY EACH OF THE MERIT REVIEW CRITERION AND SUB-CRITERION.
- Relevance and Outcomes/Impacts: This section should explain the relevance of the effort to the objectives in the program announcement and the expected outcomes and/or impacts.
- Roles Of Participants: For multi-organizational or multi-investigator projects, describe the roles and the work to be performed by each participant/investigator, business agreements between the applicant and participants, and how the various efforts will be integrated and managed.
- Facilities And Other Resources: Identify the facilities (e.g., office, laboratory, computer, etc.) to be used at each performance site listed and, if appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Provide any information describing the other resources available to the project such as machine and electronics shops.
- Equipment: List important items of equipment already available for this project and, if appropriate, note the location and pertinent capabilities of each. If you are proposing to acquire equipment, describe comparable equipment, if any, already at your organization and explain why it cannot be used.
- Statement Of Project Objectives (SOPO):
The Department of Energy's, National Energy Technology Laboratory uses a specific format for Statement of Project Objectives in its awards. In announcements such as this one, where the Government does not provide a Statement of Project Objectives, the Applicant is to provide one, which the DOE will then use to generate the Statement of Project Objectives to be included in the award.

The project narrative must contain a single, detailed Statement of Project Objectives that addresses how the project objectives will be met. The Statement of Project Objectives must contain a clear, concise description of all activities to be completed during project performance and follow the structure discussed below. The Statement of Project Objectives may be released to the public by DOE in whole or in part at any time after award. It is therefore required that it shall not contain proprietary or confidential business information.

The Statement of Project Objectives is generally less than 10 pages in total for the proposed work. Applicants shall prepare the Statement of Project Objectives in the following format:

TITLE OF WORK TO BE PERFORMED

(Insert the title of work to be performed. Be concise and descriptive.)

A. OBJECTIVES

Include one paragraph on the overall objective(s) of the work. Also, include objective(s) for each phase of the work.

B. SCOPE OF WORK

This section should not exceed one-half page and should summarize the effort and approach to achieve the objective(s) of the work for each Phase.

C. TASKS TO BE PERFORMED

Tasks, concisely written, should be provided in a logical sequence and should be divided into the phases of the project, as appropriate. This section provides a brief summary of the planned approach to this project. An outline of the Project Management Plan (referenced in Task 1.0 below and required to be submitted with your application) is provided later in this Part.

PHASE I

Task 1.0 – Project Management and Planning

(Description includes work elements required to revise and maintain the Project Management Plan and to manage and report on activities in accordance with the plan)

Subtask 1.1

(Description)

Task 2.0 - (Title)

PHASE II (Optional)

Task 3.0 - (Title)

D. DELIVERABLES

The periodic, topical, and final reports shall be submitted in accordance with the attached "Federal Assistance Reporting Checklist" and the instructions accompanying the checklist.

[Note: The Recipient shall provide a list of deliverables other than those identified on the "Federal Assistance Reporting Checklist" that will be delivered. These reports shall also be identified within the text of the Statement of Project Objectives. See the following examples:

1. Task 1.1 - (Report Description)
2. Task 2.2 - (Report Description)

E. BRIEFINGS/TECHNICAL PRESENTATIONS (If applicable)

The Recipient shall prepare detailed briefings for presentation to the Project Officer at the Project Officer's facility located in Pittsburgh, PA or Morgantown, WV. Briefings shall be given by the Recipient to explain the plans, progress, and results of the technical effort approximately three times per year.

The Recipient shall provide and present a technical paper(s) at the DOE/NETL Annual Contractor's Review Meeting to be held at the NETL facility located in Pittsburgh, PA or Morgantown, WV.

- Project Performance Site:
Indicate the primary site where the work will be performed. If a portion of the work will be performed at any other sites, identify those sites, also.
- Biographical Sketch Appendix:
Provide a biographical sketch for the project director/principal investigator (PD/PI) and each senior/key person listed in Section A on the R&R Budget form. Provide the biographical sketch information as an appendix to your project narrative. Do not attach a separate file. The biographical sketch appendix will not count in the project narrative page limitation. The biographical information for each person must not exceed 2 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point and must include:

Education and Training:
Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree, and year.

Research and Professional Experience:
Beginning with the current position list, in chronological order, professional/academic positions with a brief description.

Publications:
Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically.

Patents, copyrights, and software systems developed may be provided in addition to or substituted for publications.

Synergistic Activities: List no more than 5 professional and scholarly activities related to the effort proposed.
- Bibliography & References Cited Appendix:
Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application. In order to reduce the number of files attached to your application, please provide the Bibliography and References Cited information as an appendix to your project narrative. Do not attach a file in field 8. This appendix will not count in the project narrative page limitation.
- Facilities & Other Resources Appendix:
This information is used to assess the capability of the organizational resources, including subawardee resources, available to perform the effort proposed. Identify the facilities to be used (Laboratory, Animal, Computer, Office, Clinical, and Other).

If appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Describe other resources available to the project (e.g., machine shop, electronic shop) and the extent to which they would be available to the project. In order to reduce the number of files attached to your application, please provide the Facility and Other Resource information as an appendix to your project narrative. Do not attach a file in field 9. This appendix will not count in the project narrative page limitation.

- Equipment Appendix:
List major items of equipment already available for this project and, if appropriate identify location and pertinent capabilities. In order to reduce the number of files attached to your application, please provide the Equipment information as an appendix to your project narrative. Do not attach a file in field 10. This appendix will not count in the project narrative page limitation.

Other Attachments (Field 11 on the form):

If you need to elaborate on your responses to questions 1-5 on the “Other Project Information” document, attach a file in field 11.

Also, attach the following files:

Project Management Plan

This plan should be formatted to include the following sections with each section to include the information as described below:

- A. Executive Summary: Provide a description of the project that includes the objective, project goals, and expected results. For purposes of the application, this information is included in the Project Narrative (Field 7) and should be simply copied to this document for completeness, so that the Project Management Plan is a stand-alone document.
- B. Risk Management: Provide a summary description of the proposed approach to identify, analyze, and respond to perceived risks associated with the proposed project. Project risk events are uncertain future events that, if realized, impact the success of the project. As a minimum, include the initial identification of significant technical, resource, and management issues that have the potential to impede project progress and strategies to minimize impacts from those issues.
- C. Milestone Log: Provide milestones for each budget period (or phase) of the project. Each milestone should include a title and planned completion date. Milestones should be quantitative and show progress toward budget period and/or project goals.

[Note: During project performance, the Recipient will report the Milestone Status as part of the required quarterly Progress Report as prescribed under Attachment 4 of the award titled Reporting Requirements Checklist. The Milestone Status will present actual performance in comparison with Milestone Log, and include:

- (1) the **actual** status and progress of the project,
- (2) specific progress made toward achieving the project’s milestones, and,
- (3) any proposed changes in the project’s schedule required to complete milestones.]

D. **Funding and Costing Profile:** Provide a table (the Project Funding Profile) that shows, by budget period, the amount of government funding going to each project team member. Also, provide a table (the Project Costing Profile) that projects, by month, the expenditure of government funds for the first budget period, at a minimum.

E. **Project Timeline:** Provide a timeline of the project (similar to a Gantt chart) broken down by each task and subtask, as described in the Statement of Project Objectives. The timeline should include for each task, a start date, and end date. The timeline should show interdependencies between tasks and include the milestones that are identified in the Milestone Log (Section C).

F. **Success Criteria at Decision Points:** Provide success criteria for each decision point in the project, including go/no-go decision points and the conclusions of budget periods and the entire project. The success criteria should be objective and stated in terms of specific, measurable, and repeatable data. Usually, the success criteria pertain to desirable outcomes, results, and observations from the project.

[Note: As the first task in the Statement of Project Objectives, successful applicants will revise the version of the Project Management Plan that is submitted with their applications by including details from the negotiation process. This Project Management Plan will be updated by the Recipient as the project progresses, and the Recipient must use this plan to report schedule and budget variances.]

Save this plan in a single file named “pmp.pdf” and click on “Add Attachments” in Field 11 to attach.

Commitment Letters from Third Parties Contributing to Cost Sharing

If a third party, (i.e., a party other than the organization submitting the application) proposes to provide all or part of the required cost sharing, the applicant must include a letter from the third party stating that it is committed to providing a specific minimum dollar amount of cost sharing. The letter should also identify the proposed cost sharing (e.g., cash, services, and/or property) to be contributed. Letters must be signed by the person authorized to commit the expenditure of funds by the entity and be provided in a PDF format. Save this information in a single file named “CLTP.pdf” and click on “Add Attachments” in Field 11 to attach.

Budget for DOE/NNSA Federally Funded Research and Development Center (FFRDC) Contractor, if applicable.

If a DOE/NNSA FFRDC contractor is to perform a portion of the work, you must provide a DOE Field Work Proposal in accordance with the requirements in DOE Order 412.1 Work Authorization System. This order and the DOE Field Work Proposal form are available at http://management.energy.gov/business_doe/business_forms.htm. Use the FFRDC name as the file name (up to 10 letters) and attach to the R&R Other Project Information form in Field 11 – Add Attachments.

Environmental Questionnaire

You must complete the environmental questionnaire at www.eere-pmc.energy.gov. Save the questionnaire in a single file named “Env.pdf” and click on “Add Attachments” in Field 11 to attach.

SF 424 C Excel, Budget Information – Construction Programs

If you plan to have a subawardee provide construction services on your proposed RD&D project, submit a SF 424 C Excel Budget Information – Construction Programs form (available at http://management.energy.gov/business_doe/business_forms.htm) for the

subawardee's construction effort, instead of a R&R Subaward Budget Attachment. Complete a SF 424 C budget for each year of support requested and a cumulative budget for the total project period. You must also identify the subawardees construction costs on your RESEARCH AND RELATED BUDGET form on the Subaward/Consortium/Contractual Costs line (Line F.5). Justify the construction costs in your budget justification file and identify who will be performing the work. Save the SF 424 C budgets in a single file named "SF424C.xls," and attach to the RESEARCH AND RELATED Other Project Information form. Click on "Add Attachments" in Field 11 to attach.

3. RESEARCH AND RELATED BUDGET (TOTAL FED + NON-FED)

Complete the Research and Related Budget (Total Fed & Non-Fed) form in accordance with the instructions on the form (Activate Help Mode to see instructions) and the following instructions. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You must complete all the mandatory information on the form before the NEXT PERIOD button is activated. You may request funds under any of the categories listed as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this announcement (See PART IV. G).

Budget Justification (Field K on the form).

Provide the required supporting information for the following costs (See R&R instructions): equipment; domestic and foreign travel; participant/trainees; material and supplies; publication; consultant services; ADP/computer services; subaward/consortium/contractual; equipment or facility rental/user fees; alterations and renovations; and indirect cost type. Provide any other information you wish to submit to justify your budget request. If cost sharing is required, provide an explanation of the source, nature, amount, and availability of any proposed cost sharing. Attach a single budget justification file for the entire project period in Field K. The file automatically carries over to each budget year.

4. R&R SUBAWARD (Total Fed + Non-Fed) FORM

Budgets for Subawardees, other than DOE FFRDC Contractors. You must provide a separate cumulative R&R budget for each subawardee that is expected to perform work estimated to be more than \$100,000 or 50 percent of the total work effort (whichever is less). Download the R&R Budget Attachment from the R&R SUBAWARD BUDGET (Total Fed + Non-Fed) FORM and e-mail it to each subawardee that is required to submit a separate budget. After the Subawardee has e-mailed its completed budget back to you, attach it to one of the blocks provided on the form. Use up to 10 letters of the subawardee's name as the file name.

5. Disclosure of Lobbying Activities (SF-LLL)

If applicable, complete SF- LLL. Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying."

Name of Document	Format	Attach to
SF 424 (R&R)	Form	N/A
RESEARCH AND RELATED Other Project Information	Form	N/A
Project Summary/Abstract	PDF	Field 6
Project Narrative, including required appendices	PDF	Field 7
Project Management Plan	PDF	Field 11
Commitment Letters from Third Parties	PDF	Field 11
Budget for DOE/NNSA FFRDC, if applicable	PDF	Field 11
Environmental Questionnaire	PDF	Field 11
SF 424C Excel - Budget Information for Construction Programs File	PDF	Field 11
RESEARCH AND RELATED BUDGET (Total Fed + Non-Fed)	Form	N/A
Budget Justification	PDF	Field K
R&R SUBAWARD BUDGET (Total Fed + Non-Fed) ATTACHMENT(S) FORM , if applicable	Form	N/A
SF-LLL Disclosure of Lobbying Activities , if applicable	Form	N/A

C. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

If selected for award, DOE/NNSA reserves the right to request additional or clarifying information for any reason deemed necessary, including, but not limited to:

- Indirect cost information
- Other budget information
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable
- Commitment Letter from Third Parties Contributing to Cost Sharing, if applicable

D. SUBMISSION DATES AND TIMES

1. Pre-application Due Date

- Pre-applications are not required.

2. Application Due Date

- Applications should be received by January 16, 2009, not later than 11:59:59 PM Eastern Time. You are encouraged to transmit your application well before the deadline. The Grants.gov Helpdesk is not available after 9:00 PM Eastern Time. APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.

E. INTERGOVERNMENTAL REVIEW

- This program is not subject to Executive Order 12372 – Intergovernmental Review of Federal Programs.

F. FUNDING RESTRICTIONS

Cost Principles Costs must be allowable in accordance with the applicable Federal cost principles referenced in 10 CFR part 600. The cost principles for commercial organization are in FAR Part 31.

Pre-award Costs Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR part 600. Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90 day calendar period.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

G. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS

1. Where to Submit

APPLICATIONS MUST BE SUBMITTED THROUGH GRANTS.GOV TO BE CONSIDERED FOR AWARD. Submit electronic applications through the "Apply for Grants" function at www.Grants.gov. If you have problems completing the registration process or submitting your application, call Grants.gov at 1-800-518-4726 or send an email to support@grants.gov.

2. Registration Process

- You must COMPLETE the one-time registration process (all steps) before you can submit your first application through Grants.gov (See www.grants.gov/GetStarted). **We recommend that you start this process at least three weeks before the application due date.** It may take 21 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at <http://www.grants.gov/assets/OrganizationRegCheck.pdf> to guide you through the process. **IMPORTANT:** During the CCR registration process, you will be asked to designate an E-Business Point of Contact (EBIZ POC). The EBIZ POC must obtain a special password called "Marketing Partner identification Number" (MPIN). When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e., Grants.gov registration).

3. Application Receipt Notices

- After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five e-mails. It is extremely important that the AOR watch for and save each of the emails. It may take up to two (2) business days from application submission to receipt of email Number 2. When the AOR receives email Number 5, it is their responsibility to follow the instructions in the email to logon to IIPS and verify that their application was received by DOE. You will need the Submission Receipt Number (email Number 1) to track a submission. The titles of the five e-mails are:

Number 1 - Grants.gov Submission Receipt Number

Number 2 - Grants.gov Submission Validation Receipt for Application Number

Number 3 - Grants.gov Grantor Agency Retrieval Receipt for Application Number

Number 4 - Grants.gov Agency Tracking Number Assignment for Application Number

Number 5 – DOE e-Center Grant Application Received

The last email will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last email changes to:

Number 5 – DOE e-Center Grant Application Received and Matched

This email will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

Part V - APPLICATION REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria

- Prior to a comprehensive merit evaluation, DOE will perform an initial review to determine that (1) the applicant is eligible for an award; (2) the information required by the announcement has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the funding opportunity announcement.

2. Merit Review Criteria

- All applications that pass the initial review process will receive a detailed and consistent technical evaluation utilizing the evaluation criteria described below.

Criterion 1: Technical Merit of Technology (35%)

- a) Responsiveness and relevance of the application to the programmatic research goals and requirements identified in this announcement for the area of interest;
- b) Knowledge and understanding of past and current work in the technology area proposed and how the proposed effort builds on or expands from prior efforts;
- c) Degree and nature of the identified risk in developing the proposed technology, including definition of potential technology deficiencies and proposed solutions;
- d) Innovativeness of the proposed technology;
- e) Scientific soundness and technical feasibility of the proposed technology (Is it based on sound scientific principles and on an understanding of the current state-of-the-art technology?);
- f) Adequacy of discussion of the degree of the current state of development of the proposed technology, including any modeling or laboratory data and results;
- g) Adequacy of the rationale for the proposed scale for each budget period in accordance with the Statement of Project Objectives; and
- h) Anticipated outcomes and benefits of the proposed technology.

Criterion 2: Research Plan (25%)

- a) Adequacy and thoroughness of the approach to the proposed work to successfully meet the project objectives, including plans to comprehensively address key problems and hurdles to the viability of the technology;
- b) Adequacy of the planned research and development to address key operational and performance aspects of the technology, including the level of detail for proposed test matrices, data acquisition, and sampling and analysis protocols;
- c) Adequacy and appropriateness of the schedule including the duration and sequencing of tasks and the scheduling of project milestones and decision points;
- d) Clarity, completeness, and adequacy of the SOPO;
- e) Adequacy of plans for continued development, integration, and/or commercialization of the proposed technology beyond the proposed effort; and
- f) Appropriateness of the planned level of manpower.

Criterion 3: Key Personnel and Facilities (20%)

- a) Qualifications and capabilities of key personnel;

- b) Prior success of key personnel in conducting research at the proposed scales of development;
- c) Extent of involvement of the prime applicant in the execution of the proposed work;
- d) Ability to assemble a team necessary for the successful development of the technology;
- e) Availability and adequacy of equipment, facilities, and other support necessary for the successful performance of the proposed work;
- f) Appropriateness of the planned assignment of responsibilities and level of effort among individuals and team members; and
- g) Adequacy and appropriateness of the proposed management plan for coordinating, directing, and performing the proposed work.

Criterion 4: Energy, Environmental, and Economic Benefits (20%)

- a) Potential of the proposed technology to reduce or support the reduction of the energy consumption of the domestic transportation sector;
- b) Potential for the proposed technology to reduce or support the reduction of the environmental impacts of the domestic transportation sector;
- c) Potential to provide or support economic benefits to end-use U.S. consumers; and
- d) General applicability, timeliness, and economic viability of the proposed technology and potential to improve competitiveness of the domestic transportation sector.

3. Other Selection Factors

The selection official may consider the following program policy factors in the selection process:

- 1. It may be desirable to select projects for award of less technical merit than other projects, if such a selection will optimize use of available funds by allowing more technically acceptable projects to be supported while not being detrimental to the overall objectives of the program.
- 2. It may be desirable to select a project(s) that represents an HBCU or other minority institution.
- 3. It may be desirable to limit the number of applications selected within a given Area of Interest from one applicant university.
- 4. It may be desirable to select projects for award that represent a diversity of technology concepts and applications, as well as technical approaches.

B. REVIEW AND SELECTION PROCESS

1. Merit Review

Applications that pass the initial review will be subjected to a merit review in accordance with the guidance provided in the "Department of Energy Merit Review Guide for Financial Assistance." This guide is available under Financial Assistance, Regulations and Guidance at <http://www.management.energy.gov/documents/meritrev.pdf>.

2. Selection

The Selection Official will consider the merit review recommendation, program policy factors, and the amount of funds available.

3. Discussions and Award

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR part 600; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

- DOE anticipates notifying applicants selected for award by the end of March 2009 and making awards by the end of May 2009

Part VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

1. Notice of Selection

DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance. (See Part IV.G with respect to the allowability of pre-award costs.)

Organizations whose applications have not been selected will be advised as promptly as possible. This notice will explain why the application was not selected.

2. Notice of Award

A Notice of Financial Assistance Award issued by the contracting officer is the authorizing award document. It normally includes either as an attachment or by reference: (1). Special Terms and Conditions; (2). Applicable program regulations, if any; (3). Application as approved by DOE/NNSA.; (4). DOE assistance regulations at 10 CFR part 600, or, for Federal Demonstration Partnership (FDP) institutions, the FDP terms and conditions; (5). National Policy Assurances To Be Incorporated As Award Terms; (6). Budget Summary; and (7). Federal Assistance Reporting Checklist, which identifies the reporting requirements.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

1. Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR part 600 (See: <http://ecfr.gpoaccess.gov>), except for grants and cooperative agreements made to Federal Demonstration Partnership (FDP) institutions. The FDP terms and conditions and DOE FDP agency specific terms and conditions are located on the National Science Foundation web site at http://www.nsf.gov/awards/managing/fed_dem_part.jsp.

2. Special Terms and Conditions and National Policy Requirements

The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at http://management.energy.gov/business_doe/business_forms.htm.

The National Policy Assurances To Be Incorporated As Award Terms are located at DOE http://management.energy.gov/business_doe/business_forms.htm.

Intellectual Property Provisions

The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at http://www.gc.doe.gov/financial_assistance_awards.htm.

DOE's Statement of Substantial Involvement

Reviewing in a timely manner project plans, including technology transfer plans, and recommending alternate approaches to the work effort if the plans do not address critical programmatic issues;

- Suggesting specified kinds of direction or redirection of the work because of

interrelationships with other projects.

- Reviewing in a timely manner, technical reports and other deliverables and providing comments to the Recipient;
- Conducting project and program review meetings to ensure adequate progress and that the work accomplishes the program and project objectives. Recommending alternate approaches to work or shifting work emphasis, if needed;
- Review of Continuation Application materials and concurrence for continuation into subsequent budget periods;
- Promoting and facilitating technology transfer activities, including disseminating program results through presentations and publications; and
- Serving as scientific/technical liaison between awardees and other program or industry staff.

C. REPORTING

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement. See the NETL Business Page at <http://www.netl.doe.gov/business/forms/FederalAssistanceReportingChecklistExample.pdf> for the proposed Checklist for this program.

PART VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions regarding the content of the announcement must be submitted through the “Submit Question” feature of the DOE Industry Interactive Procurement System (IIPS) at <http://e-center.doe.gov>. Locate the program announcement on IIPS and then click on the “Submit Question” button. Enter required information. You will receive an electronic notification that your question has been answered. DOE/NNSA will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website.

Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. DOE/NNSA cannot answer these questions.

B. AGENCY CONTACT

Name:	Carla Winaught
E-mail:	Carla.Winaught@netl.doe.gov
FAX:	(304) 285-4683
Telephone (Optional):	(304) 285-4530

PART VIII - OTHER INFORMATION

A. MODIFICATIONS

Notices of any modifications to this announcement will be posted on Grants.gov and the DOE Industry Interactive Procurement System (IIPS). You can receive an email when a modification or an announcement message is posted by joining the mailing list for this announcement through the link in IIPS. When you download the application at Grants.gov, you can also register to receive notifications of changes through Grants.gov.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

DOE reserves the right, without qualification, to reject any or all applications received in response to this announcement and to select any application, in whole or in part, as a basis for negotiation and/or award.

C. COMMITMENT OF PUBLIC FUNDS

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

D. PROPRIETARY APPLICATION INFORMATION

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, should be included in an application only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of the project narrative and specifies the pages of the application which are to be restricted:

“The data contained in pages _____ of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government’s right to use or disclose data obtained without restriction from any source, including the applicant.”

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following:

“The following contains proprietary information that (name of applicant) requests not be released to persons outside the Government, except for purposes of review and evaluation.”

E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL

In conducting the merit review evaluation, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM

Patent Rights. The government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. 42 U.S.C. 5908 provides that title to such inventions vests in the United States, except where 35 U.S.C. 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See “Notice of Right to Request Patent Waiver” in paragraph G below.)

Rights in Technical Data. Normally, the government has unlimited rights in technical data created under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE’s own needs or to insure the commercialization of technology developed under a DOE agreement.

G. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation